

Date: Wednesday, 4/5/2006 3:30:34 PM
 User: Kim Johnston

Process Sheet

Customer	: CU-DAR001 Dart Helicopters Services	Drawing Name	: FWD TUBE ASSEMBLY
Job Number	: 26568		
Estimate Number	: 10467		
P.O. Number	: <i>NIA</i>	Part Number	: D3391021
This Issue	: 4/5/2006 S.O. No. : <i>NIA</i>	Drawing Number	: D3391 REV D
Prsht Rev.	: NC	Project Number	: N/A
First Issue	: <i>NIA</i> Type : MACHINED PARTS	Drawing Revision	: D
Previous Run	: 26567	Material	: <i>NIA</i>
Written By	: <i>SEE COMMENT BELOW</i>	Due Date	: 4/28/2006 Qty: 1 Um: Each
Checked & Approved By	: <i>06/04/06</i>		
Comment	: Est. A 05.09.13 New issue KJ/JLM Est. B 06.02.10 Dwg rev.D ech 773 EC		

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
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1.0	D6013047	SKIDTUBE MAT'L
-----	----------	----------------



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)

SKIDTUBE MAT'L

Pick:

Qty	Part Number	Description	Batch
1	D6013-047	Extrusion	<i>B23935 DP06-4-9</i>

2.0	LANDING GEAR 1	LANDING GEAR RESOURCE 1
-----	----------------	-------------------------



Comment: LANDING GEAR RESOURCE 1

Cut extrusion to 46.52 +0.010 -0.020

ml 06/04/16

3.0	BENDING	BENDING MACHINE
-----	---------	-----------------



Comment: No bender

Bend as per Dwg D3391 Using Bend Prog 3391021

DP06-4-12

4.0	QC5	INSPECT WORK TO CURRENT STEP
-----	-----	------------------------------



Comment: INSPECT WORK TO CURRENT STEP

06/04/13

5.0	HAAS1	HAAS CNC VERTICAL MACHINING #1
-----	-------	--------------------------------



Comment: HAAS CNC VERTICAL MACHINING #1

1-Machine as per Folio FA590 Rev. *AA* & Dwg D3391 Rev. *D*

Identify as D3391-1

2-Deburr

ml 06/04/16

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Wednesday, 4/5/2006 3:30:34 PM
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Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: FWD TUBE ASSEMBLY

Job Number: 26568

Part Number: D3391021

Job Number:



Seq. #:

Machine Or Operation:

Description :

6.0

QC2

INSPECT PARTS AS THEY COME OFF MACHINE



Comment: INSPECT PARTS AS THEY COME OFF MACHINE

ML 06/04/16

7.0

QC8

SECOND CHECK



Comment: SECOND CHECK

MS 06/04/26

8.0

LANDING GEAR 1

LANDING GEAR RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1-Drill and c/sink float bag holes as per Dwg D3391 using DT8798(Do not open tow cap holes to finish size)
(ONLY DRILL HOLES MARKED "A") BE 06-04-27 (1)

2-Drill Remaining two holes for tow cap using DT 8819 Locating off of .1875" holes drilled in previous step BE 06-04-27 (1)

3-Open tow cap holes to .208" as per Dwg D3391 BE 06-04-27 (1)

4-Open Tow Ring hole to .640" as per Dwg D3391 BE 06-04-27 (1)

5-Drill wearplate holes as per Dwg D3391 Using Dt8217 & DT8878 BE 06-04-27 (1)

6--Deburr BE 06-04-27 (1)

9.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Acid etch and Alodine as per QSI 005 4.1

FC 06 05 03 (1)

10.0

POWDER COATING

POWDER COATING



Comment: POWDER COATING

Powder Coat White Gloss (Ref: 4.3.5.1) as per QSI 005 4.3

PL 06/05/03 (1)

11.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

ML 06 05 03 (1)

8.1 QC5 DP 06-5-2

9.1 QC3

DL 06/05/03 (1)

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Wednesday, 4/5/2006 3:30:34 PM
User: Kim Johnston

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: FWD TUBE ASSEMBLY

Job Number: 26568

Part Number: D3391021

Job Number:



Seq. #:

Machine Or Operation:

Description :

12.0

D3401041

Tow Cap Assembly



Comment: Qty.: 1.0000 Each(s)/Unit Total : 1.0000 Each(s)
Tow Cap Assembly

Pick:

Qty	Part Number	Description	Batch
1	D3401-041	Tow Cap	B26590

13.0

AN3C4A

BOLT



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)
Bolt

Pick:

Qty	Part Number	Description	Batch
4	AN3C4A	Bolt	M100651

14.0

NAS1330C3KB166



Comment: Qty.: 14.0000 Each(s)/Unit Total : 14.0000 Each(s)
Rivnut

Pick:

Qty	Part Number	Description	Batch
14	NAS1330C3KB166	Insert	M100732

15.0

NAS1515H3L

WASHER



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)
Washer

Pick:

Qty	Part Number	Description	Batch
4	NAS1515H3L	Washer	M100186

16.0

AN960C10L

washer



Comment: Qty.: 4.0000 Each(s)/Unit Total : 4.0000 Each(s)
washer

M 18822 DL 04/05/03 (1)

17.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: SMALL & MEDIUM FAB RESOURCE 1

Install inserts and Tow Cap as per Dwg D3391
Identify as D3391-021

DL 04/05/03 (1)

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes (No) DQA: PE Date: 20/05/22
 QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Date: Wednesday, 4/5/2006 3:30:34 PM
User: Kim Johnston

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: FWD TUBE ASSEMBLY

Job Number: 26568

Part Number: D3391021

Job Number:



Seq. #:

Machine Or Operation:

Description :

18.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

Inspect thread of each insert using DT8821

Handwritten initials

05 03

(1)

19.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and Stock

Location: *N/A*

DC 04/05/25

(1)

20.0

DC

DOCUMENT CONTROL



Comment: DOCUMENT CONTROL

Inspection Level 21

DC 06/05/29

(1)

Job Completion



W Dec 5. 29

Dart Aerospace Ltd

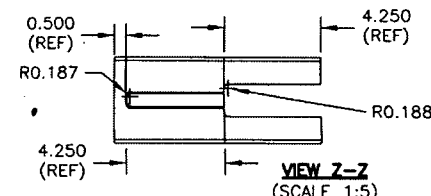
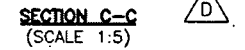
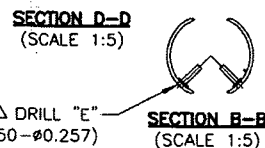
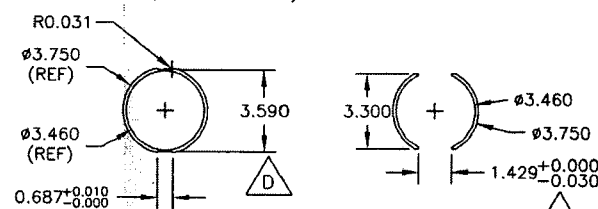
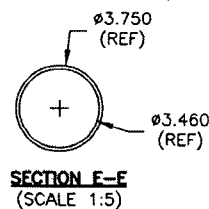
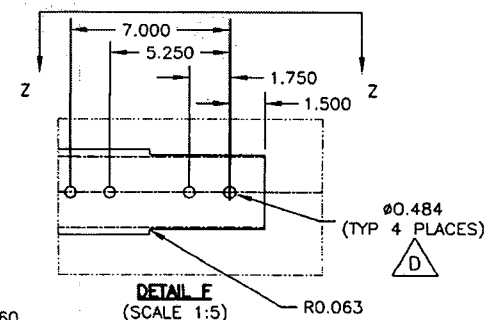
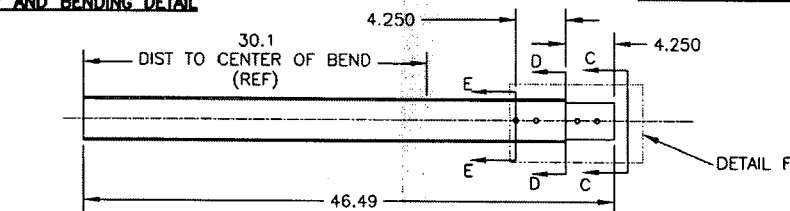
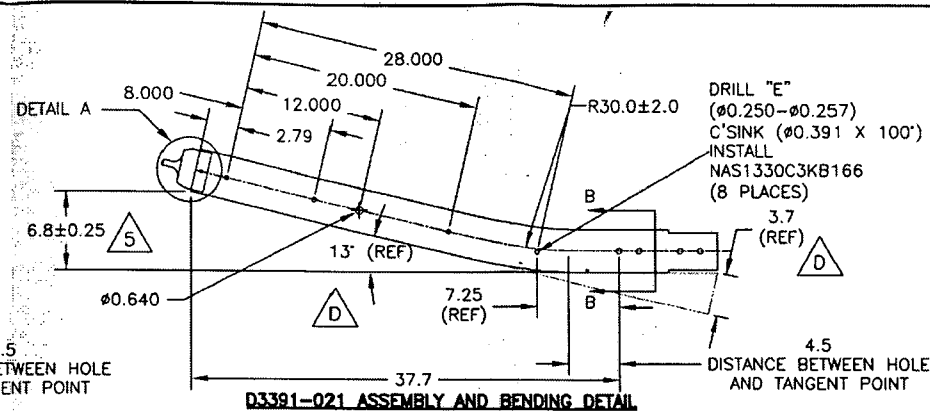
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DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



D3391-011/-021 FWD TUBE ASSEMBLY PARTS LIST

QTY - 011	QTY - 021	PART NUMBER	DESCRIPTION
X		D3391-011	FWD TUBE ASSEMBLY
	X	D3391-021	FWD TUBE ASSEMBLY
1	1	D6013-047	FWD TUBE
1	1	D3401-041	TOW CAP
4	4	AN3C4A	BOLT
4	4	NAS1515H3L	WASHER
4	4	AN960C10L	WASHER
24	14	NAS1330C3KB166	INSERT

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DESIGN PH

CHECKED

DATE
06.01.23

DRAWN BY PH

APPROVED

10

DART DART AEROSPACE USA, INC.
PORT HADLOCK, WA

DRAWING NO
D3391

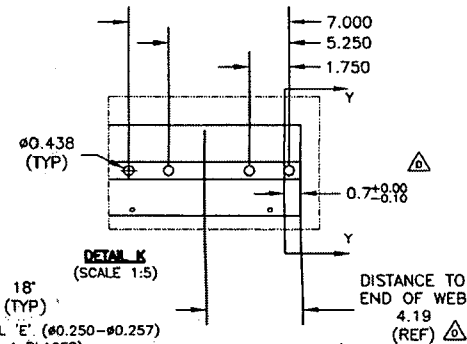
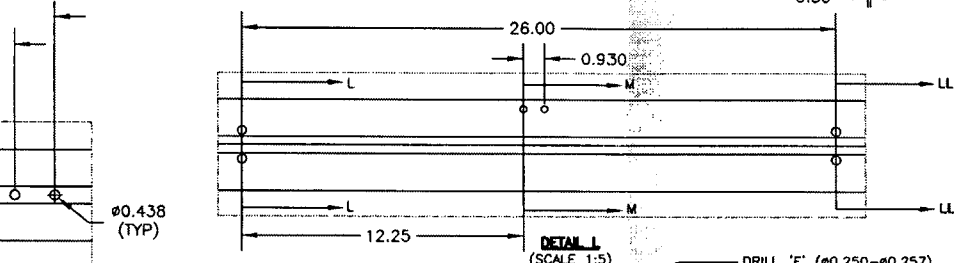
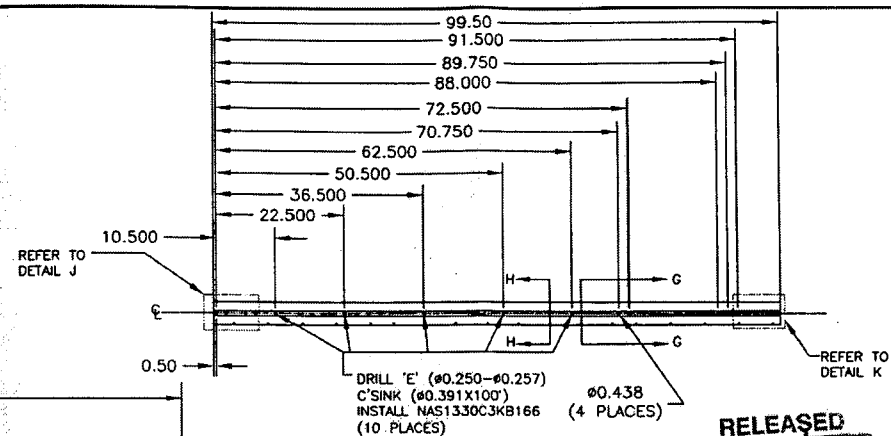
TITLE	412 FLOAT SKIDTUBE
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AEROSPACE USA, INC.
PORT HADLOCK, WA

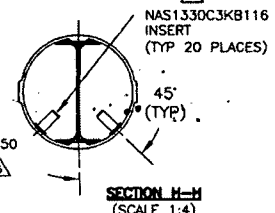
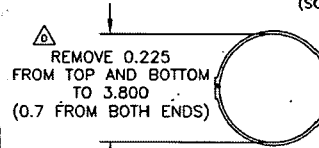
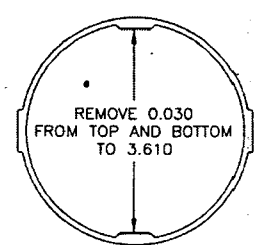
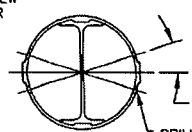
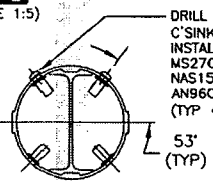
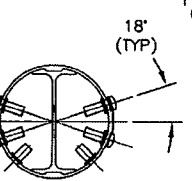
REV. C
SHEET 2 OF 5

SCALE
1-10

NO. 26568






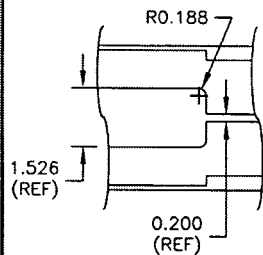
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X		D3391-013	MID TUBE ASSEMBLY
	X	D3391-023	MID TUBE ASSEMBLY •
1	1	D2500-1-100	EXTRUSION
1	1	D3389-1	WEB
24	20	NAS1330C3KB116	INSERT
24	10	NAS1330C3KB166	INSERT
4		NAS1328C4KB140	INSERT
4		NAS 1515H3L	WASHER
4		AN960C10L	WASHER
4		NAS 1515H4L	WASHER
4		AN960C416L	WASHER
4		MS27039C1-09	SCREW
4		MS27039C4-08	SCREW



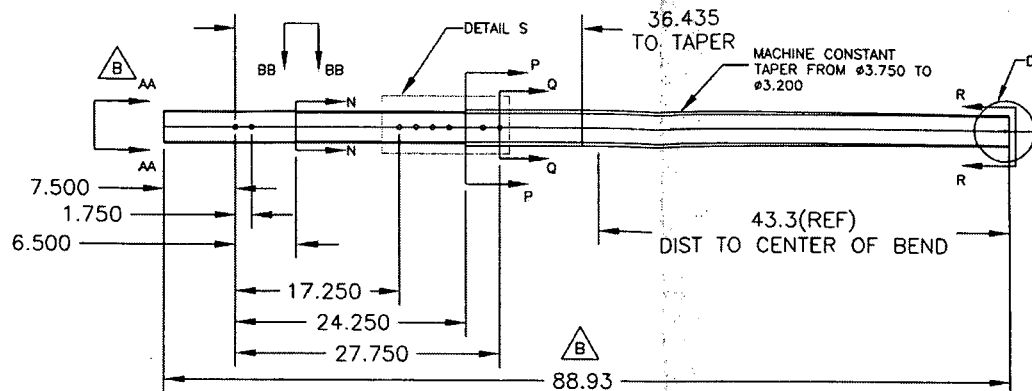
2) INSTALL D3389-1 WEB TO OUTER TUBE USING SIKAFLEX-2417-2913 PER QSI 01

NO. 17-291-17
SUBJECT: TO AMENDMENT
WITH: OUT NOTICE
ORDER
26528
KTRUSION
G SIKAFLEX
ENGINEERING
TURN TO
SHIP COPY
CONTROLLED COPY

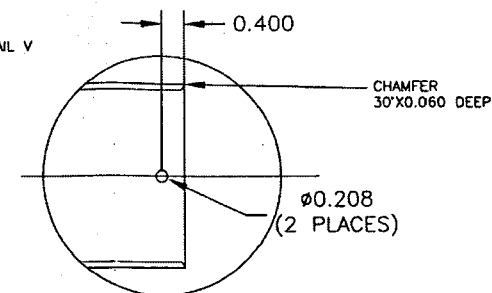
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		DATE 06.01.23		TITLE 412 FLOAT SKITUBE	SCALE 1:20



VIEW BB-BB
(SCALE 1:3)



D3391-3 AFT DRILLING AND CUTTING DETAIL
(MAKE FROM D6014-090 SKIDTUBE MATERIAL)



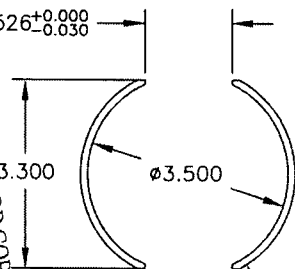
DETAIL V
(SCALE 1:2)

RELEASED

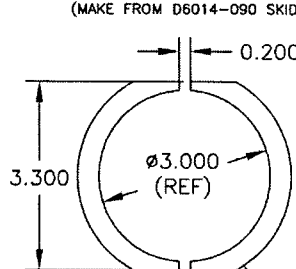
06.01.27

1.526^{+0.000}_{-0.030}

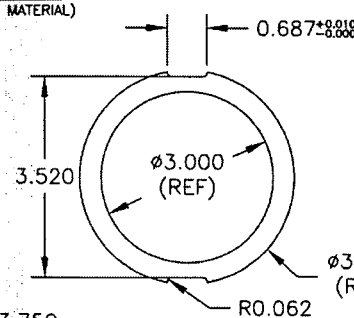
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ENGINEERING
RETURN TO
SHOP COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 265768



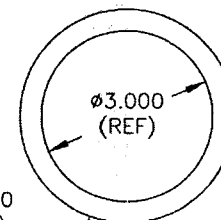
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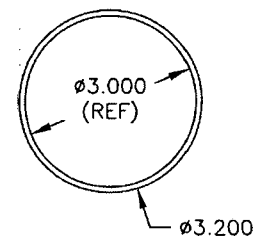
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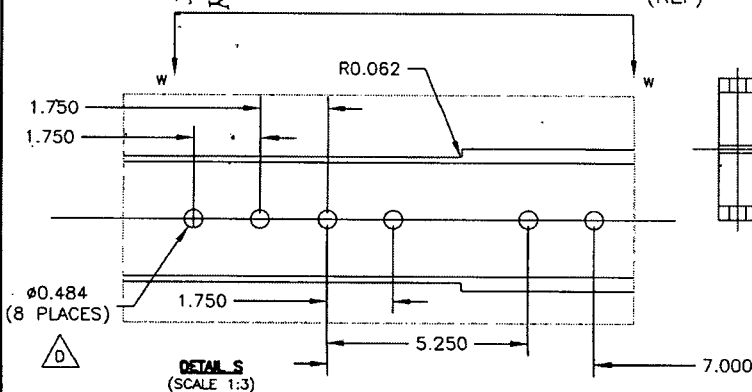
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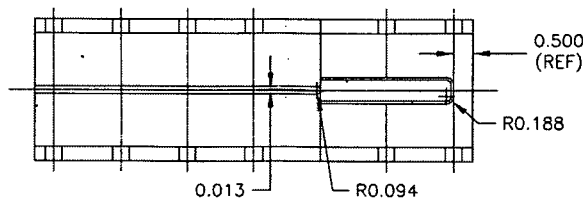
SECTION Q-Q
(SCALE 1:2)



SECTION R-R
(SCALE 1:2)



DETAIL S
(SCALE 1:3)



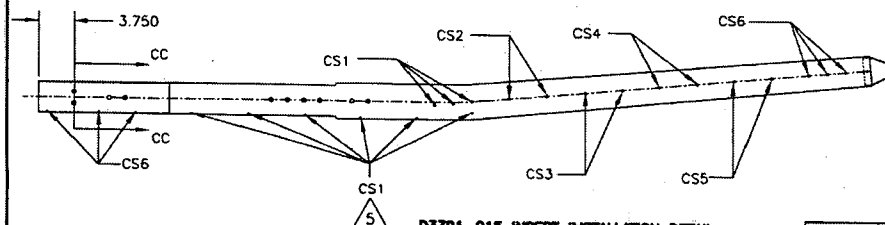
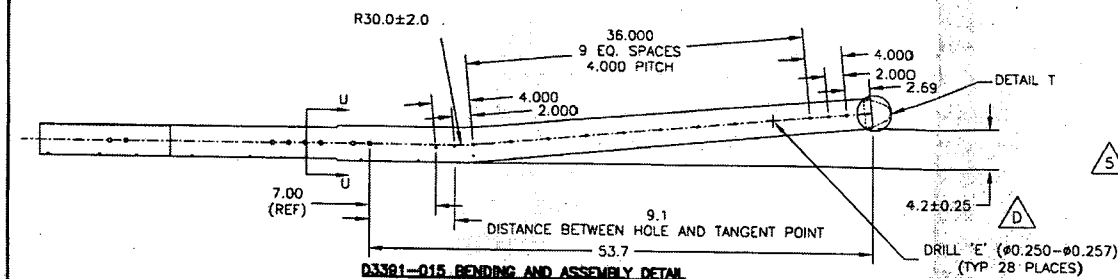
VIEW W-W
(SCALE 1:3)

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DESIGN PH	DRAWN BY PH	DART DART AEROSPACE USA, INC. PORT HADLOCK, MA	REV. D
CHECKED #	APPROVED #	DRAWING NO. D3391	SHEET 4 OF 5
DATE 06.01.23	TITLE 412 FLOAT SKIDTUBE	SCALE 1:12	

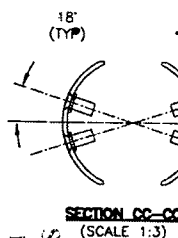
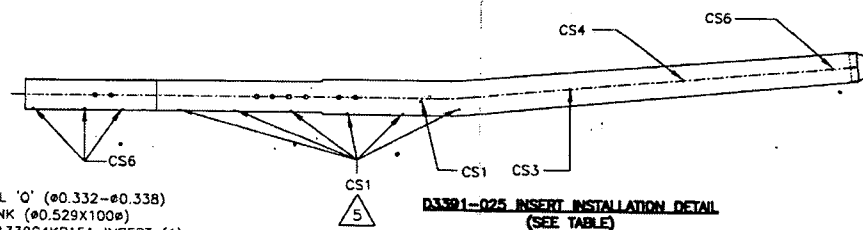
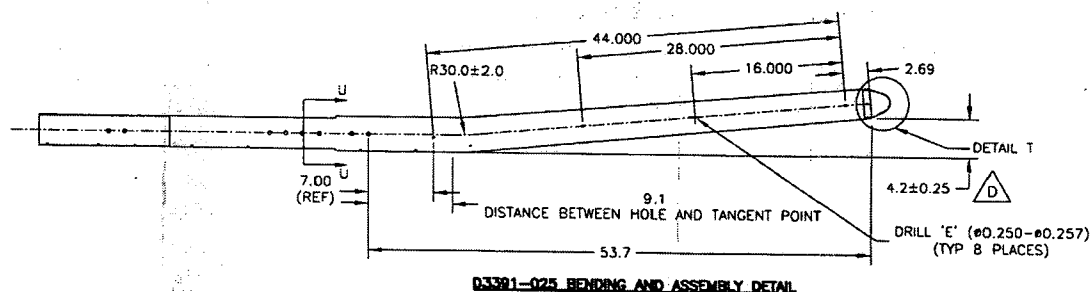
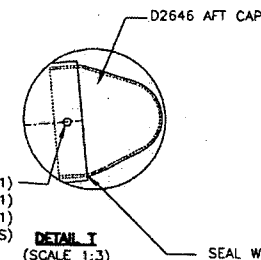
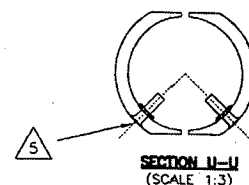
RELEASED
06.01.27



HOLES MARKED	QTY D3391-015	QTY D3391-025	C'SINK	P/N
CS1	18	14	Ø0.425	AESS10KB366
CS2	4		Ø0.391	AESS10KB366
CS3	4	2	Ø0.391	NAS1330C3KB316
CS4	4	2	Ø0.391	NAS1330C3KB266
CS5	4		Ø0.391	NAS1330C3KB216
CS6	12	8	Ø0.391	NAS1330C3KB166

D3391-015/-025 AFT TUBE ASSEMBLY PARTS LIST

QTY - 015	QTY - 025	PART NUMBER	DESCRIPTION
X		D3391-015	AFT TUBE ASSEMBLY
	X	D3391-025	AFT TUBE ASSEMBLY
1	1	D6014-090	AFT TUBE
1	1	D2646	AFT CAP
18	14	AESS10KB366	INSERT
4	2	NAS1330C3KB316	INSERT
4	2	NAS1330C3KB266	INSERT
12	8	NAS1330C3KB166	INSERT
4		NAS1330C4KB151	INSERT
2	2	AN3C4A	BOLT
2	2	NAS1515H3L	WASHER
2	2	AN960C10L	WASHER



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DESIGN	PH	DRAWN BY	PH	DART AEROSPACE USA, INC. PORT HADLOCK, OH
CHECKED		APPROVED		
DATE	06.01.23	DRAWING NO.	D3391	REV. D
TITLE				SHEET 5 OF 5
412 FLOAT SKIDTUBE				SCALE 1:12

NO WORK ORDER
26568
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
ENGINEERING
SHOP COPY
RETURN TO

Peter Hum

From: David Shepherd [davids@dartaero.com]
Sent: Friday, April 21, 2006 10:59 AM
To: Peter Hum
Subject: Re: D3391-1 fwd tube tolerance update

The deviation on tolerance shown in your sketch is acceptable for current production and would be acceptable for future production with a drawing change and confirmation that production can work to these tolerances.

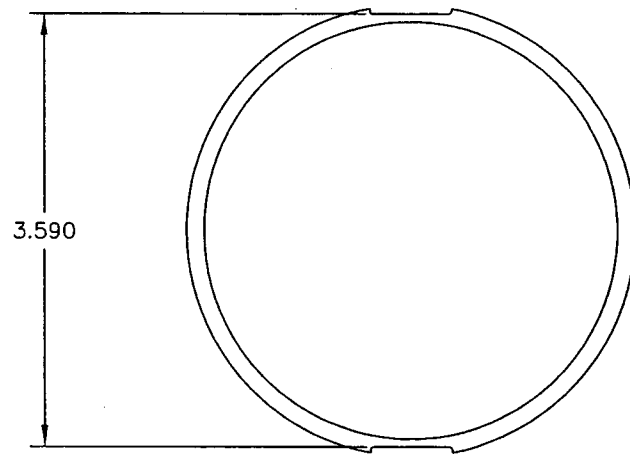
When you do the design review for the drawing change, ensure to include the sketch. I would suggest that we submit the updated dwg when we submit the drawings for the cable guard.

David

----- Original Message -----

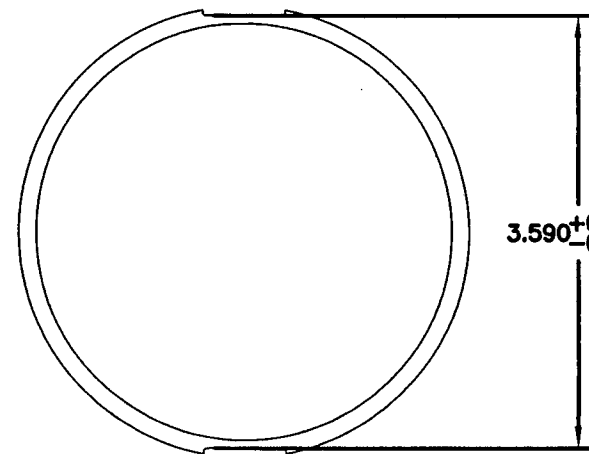
From: "Peter Hum" <phum@dartaero.com>
To: "David Shepherd (E-mail)" <davids@dartaero.com>
Sent: Wednesday, April 19, 2006 12:53 PM
Subject: D3391-1 fwd tube tolerance update

> David,
>
> I've attached a sketch (the proposed changes are in black),
>
> In machining the D3391-1 fwd tube, the dimensions of Section D-D and
Section
> C-C vary above/below the specified tolerance. In the majority of the cases
> the end result is more material and therefore an increase in strength.
>
> At the worst case tolerance (i.e. smallest area) the reduction in area is
> 0.5%. However in the critical section of the FWD tube, the ultimate margin
> of safety is 21%. Therefore, this reduction in area is very small compared
> to the overall margin of safety; therefore it will be acceptable.
>
> Can these deviations be applied to current and future production (will
> require drawing update)?
>
> Peter
>
>



3.590

NOMINAL DIMENSION

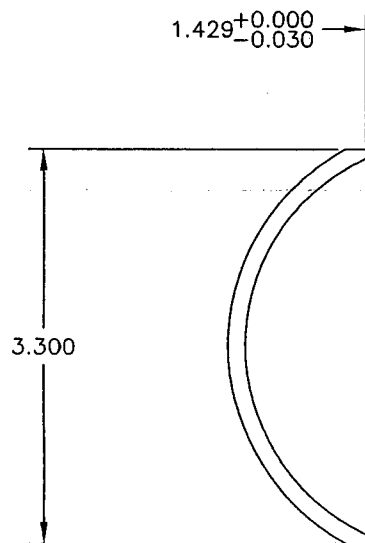


$3.590^{+0.025}_{-0.010}$

NEW DIMENSION/TOLERANCE

1) WORST CASE IS MORE MATERIAL

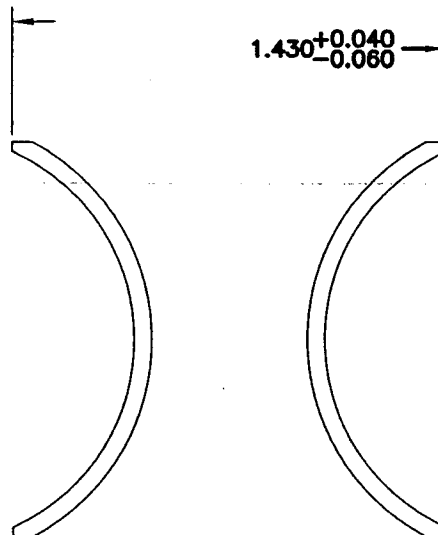
SECTION D-D



3.300

$1.429^{+0.000}_{-0.030}$

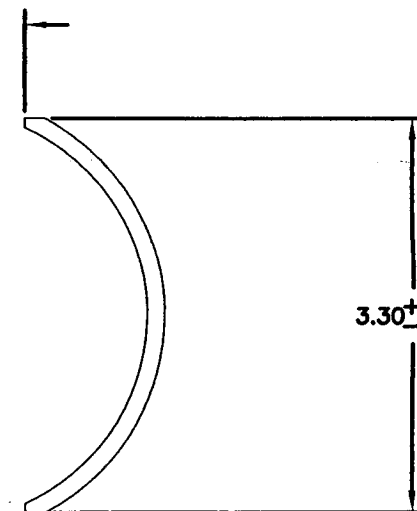
NOMINAL DIMENSION
AREA = 1.1853 IN²



$1.430^{+0.040}_{-0.060}$

NEW DIMENSION/TOLERANCE

MINIMUM AREA = 1.179 IN²



$3.30^{+0.04}_{-0.00}$

- 1) AT THE WORST CASE THE AREA IS REDUCED BY 0.5%
- 2) THE ULTIMATE MARGIN OF SAFETY OF THE CRITICAL SECTION IN THIS REGION OF THE SKIDTUBE IS 21%
- 3) THEREFORE, THIS REDUCTION WILL NOT BE A FACTOR

SECTION C-C